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Let's Stop Planning

We ourselves are in the major sense responsible for bringing about the conception of a foundry "industry." It *is* an industry, but we think that it is probably much more complicated than others. We may be wrong, but after the main divisions (iron, steel, heavy, non-ferrous and light alloy) have been established, there are so many sections and subsections that in truth no basic relationship exists. We told last week how in France there was in existence a plan to make even the smallest foundry efficient by, according to it, (1) a speciality and (2) a complete co-operative technical service. A remark we made in Paris during an after-luncheon speech warning our listeners against too much planning was so well received that we are encouraged to develop the subject. Primarily, the planners insist that many of the smaller concerns are inefficiently operated, and that by some Government control —possibly involving concentration of types of orders into selected concerns, improved efficiency would be a natural consequence. Without government control this action has been in progress for years, with the result that there exist now dozens of foundries which confine themselves to specialities of the most diverse nature.

There are some hundreds of malleable ironfounders, but of these only a handful would attempt to make boot protectors. Then there is a very large number of foundries making both iron and non-ferrous castings, which may introduce many economies in supervision, transport, provision of patterns, and so forth. In ironfounding, one meets in the list such separate trades as ingot mould, architectural, bedstead, pianoforte frames, and so forth. Ryland's directory lists no fewer than 66 separate productions. Then there are the "tied" foundries, that is, those foundries which utilise more than fifty per cent. of their output for the supply of other departments within their own organisation. It is reasonable to ask, how can one plan for such an industry? Obviously, an overriding authority can demand the imposition of more extensive social amenities. Perhaps even the use of a unified costing system could be ordered, yet this is not the sort of planning we believe to be envisaged.

We are not at all convinced that the giving of one speciality to a firm necessarily makes for efficiency, for in each of those 66 sections to which we have made reference there are to be found both efficient and not so efficient concerns. Under normal conditions there is sufficient competition to keep them all conscious of the necessity for improvement. What seems to be the worry of the planners is the small jobbing shops, which provide such a useful service to their local industries. Surely these can be ignored. Some occupy the same position as a shoeing smith or a country garage, neither of which is deemed to be part and parcel of the engineering industries. Yet some of the largest and best known firms in the engineering world had such humble origins. From the angle of size, there is the range of one man and a boy up to thousands. The foundry industry is really an aggregation of industries, with but one thing in common—they all pour liquid metal into moulds. This is quite inadequate as a basis for wholesale planning. Enlightened leadership which is now given by such organisations as the Council of Ironfoundry Associations, the Association of Bronze and Brass Founders, and smaller bodies, coupled with the technical services so readily and cheaply available, are well sufficient to ensure orderly progress. It is high time foresight replaced planning.

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Institute of Vitreous Enamellers

Annual Conference, 1947

The Thirteenth Annual Conference will be held at the Grand Hotel, Birmingham, on November 5, 6, 7 and 8. Mr. R. J. Rogers, entering his second year of office, will preside over the banquet on the Friday evening, November 7. At the annual meeting on Friday afternoon, the Vice-President, Dr. H. W. Webb, will be introduced to the members. Wednesday evening is devoted to a Council meeting.

THURSDAY, NOVEMBER 6

9.45 a.m.—Paper, "The Requirements of a Lubricant for Successful Deep Drawing, with special provision for easy removal," by Mr. P. D. Liddiard.

11.0 a.m.—Paper, "Gas Consumer demands of the Enameller," by Mr. E. W. B. Dunning.

12.30 p.m.—Luncheon.

2.0 p.m.—Leave hotel for visit to Cannon Ironfoundries, Limited, Bilston (roller-hearth-type continuous furnace).

7.30 p.m.—Visit to Theatre Royal, Birmingham.

FRIDAY, NOVEMBER 7

10.0 a.m.—Leave hotel for visit to Fisher & Ludlow, Limited, Albion Works, Birmingham, to view their new enamelling department, etc.

1.0 p.m.—Luncheon.

2.30 p.m.—Annual meeting:—(*a*) Introduction of Vice-President; (*b*) election of officers.

3.30 p.m.—Interim report of Welding Sub-Committee (Mr. E. Marks, chairman).

6.30 p.m. (at Grand Hotel).—Reception by the Deputy Lord Mayor of Birmingham and the President (Mr. R. J. Rogers).

7.0 p.m.—Annual dinner.

9.0 p.m. to 12 midnight.—Dancing (evening dress preferred).

SATURDAY, NOVEMBER 8

9.45 a.m.—Paper, "Furnace Conditions for Enamelling," by Mr. S. E. A. Ryder.

11.0 a.m.—Paper, "The Control of Shot for Blasting," by Dr. J. E. Hurst.

12.30 p.m.—Luncheon.

On November 6 the ladies of the party are to visit Stratford-on-Avon, where they will be shown over the works of Produce Canners, Limited.

Fuel Research

Testing of Domestic Heating Appliances

The sub-station of the Fuel Research Station, which is being set up in Scotland by the Department of Scientific and Industrial Research, will at first be mainly concerned with testing domestic heating appliances. More than half the domestic appliances made in Great Britain burning solid fuel are made in Scotland.

The objects of the tests are to get better appliances and not merely to reject those which are not fully satisfactory. Therefore, the scientists keep in constant touch with manufacturers during the course of a test. The almost invariable consequence is that manufacturers are able to improve their appliances as a result.

Forthcoming Events

(Secretaries are invited to send in notices of meetings, etc., for inclusion in this column.)

NOVEMBER 3.

Institution of Production Engineers.

Yorkshire Section:—"The Engineering Uses of Grey Cast Iron," by Dr. H. T. Angus, M.Sc., at the Midland Hotel, Bradford, at 7 p.m.

NOVEMBER 5.

Institute of British Foundrymen.

Lancashire Branch:—"The Influence of Production Flow on Moulding Methods in Ironfoundries and its Effect on P.M.H. and General Efficiency," by R. C. Shepherd. At the Engineers' Club, Albert Square, Manchester, at 7 p.m.

London Branch—East Anglian Section:—Symposium on "Special Patterns," contributed by local foundries. At the Central Library, Ipswich, at 7 p.m.

Institution of Production Engineers.

Preston Section:—"Fabrication *versus* Castings," by R. M. Watts, at the Harris Institute, Corporation Street, Preston, at 7.15 p.m.

NOVEMBER 5, 6, 7 and 8.

The Institute of Vitreous Enamellers.

Annual Conference at the Grand Hotel, Birmingham. Detailed programme on this page.

NOVEMBER 6.

Institute of Metals.

Birmingham Section:—"The Determination of Constitution Diagrams," by Dr. G. V. Raynor, M.A., at the James Watt Memorial Institute, Great Charles Street, Birmingham, at 6.30 p.m.

NOVEMBER 7.

The Institution of Mechanical Engineers.

"The Measurement of the Temperature of Sliding Surfaces," by R. C. Parker, Ph.D., B.Sc., and P. R. Marshall, Ph.D., B.Sc., at Storey's Gate, St. James's Park, London, S.W.1, at 5.30 p.m.

NOVEMBER 8.

Institute of British Foundrymen.

Newcastle Branch:—"The Scientist in the Foundry," by C. R. Tottle, B.Met., at the Neville Hall, Newcastle-upon-Tyne, at 6 p.m.

West Riding of Yorkshire Branch:—Visit to Hadfields', Limited, East Hecla Works, Sheffield, at 3 p.m, followed by a talk on "Steel Foundry Practice" and a film show.

Apprenticeship Schemes

We have before us two pamphlets both designed to attract boys to the foundry. The first to be received is issued by Manlove, Alliott & Company, Limited, of Nottingham, and reference to this concern's activities was made in a news paragraph in this Journal quite recently. The second one is issued by W. & T. Avery, Limited, Soho Foundry, Birmingham, 40. This simple story—written to appeal to youth—as to how grey iron castings are made, is the best so far written. If any of our readers thinks that this is easy—let him try!

On the contrary, the general conditions applying to apprentices are not well phrased. There is a weakness in "We like," a phrase which appears twice, because youths subconsciously expect adults to give orders and not to express pious hopes. Manlove, Alliott in their booklet say, "Boys joining our company will be required to take, etc." Such expressions are better appreciated by modern lads.

Institute of British Foundrymen

London Branch Presidential Address

"Management" and "Core-blowing"

At the first meeting of the 1947-48 session, the President, Mr. E. M. Currie, made an appeal for enlightened management as a means of raising the status of the industry. After this address Mr. Currie read the Paper which accompanied the showing of the film "Sandstorm Secrets" and deputised for the Author in the discussion which followed.

A meeting was held at the Waldorf Hotel, Aldwych, London, W.C.2, on Wednesday, September 24, 1947, at 7.30 p.m., Mr. E. M. Currie (Branch President) in the chair. Apologies for absence were received from:—Dr. A. B. Everest; Mr. H. W. Lockwood, Mr. McKenning, Mr. Parkinson, Mr. William Mitchell, Jnr., Mr. G. R. Webster.

The Minutes of the last Meeting of the London Branch, held at the Waldorf Hotel on Saturday, March 29, 1947, were read, confirmed and signed.

MR. CURRIE then delivered his Presidential Address, in the course of which he said:—Gentlemen, the subject of management is fascinating but far too vast for me to attempt to do more than touch upon a few points. There are libraries that specialise in the subject and hundreds of books have been written on it in all its many aspects. I would strongly urge every responsible executive in our industry to study the subject.

Too often do we see it stated that an efficient and successful industry, and from that, an efficient and happy nation depends entirely on better use of money, machines, men and research and invention, but behind all that, the real efficiency of any industry and indeed of the nation, lies solely and entirely in the effectiveness of its management.

Management Defined

Decidedly is this so in our own particular industry and I do want to emphasise, particularly to the younger generation, that management is neither more nor less than the wise guidance of human beings. Inanimate objects are not managed; it is the men and women who operate the machines, processes and methods who are "managed."

Therefore we should always give first consideration not only to the functional aspect of individuals but also to the psychological aspect—particularly welfare. To-day we hear much about apprentice training in schools and foundries. Important though this be for a long term view, it is my opinion that our vital immediate need in the foundry to-day is for supervisor and foremen training in management.

The foremen and metallurgist need to know much more than they do of the actions, principles, ethics and inter-dependence of modern business; that is, management in its fullest and widest sense. The whole conception of present-day training of these very important departmental sections of a business appears to be wrong in outlook and method.

A Transitional Product

The average foundry foremen to-day is a struggling transitional product between the old-time craftsman, promoted because he had some disciplinary sense, and the modern young man, excellently equipped with endless metallurgical theories but with little practical and organisational experience.

The more important points of character such as tact, personality and common sense remain a pious hope of the direction that they will be acquired by the man without too much upset of industrial processes. No one to-day has accepted the need for definite and specific training in such subjects yet it is in such training that the future success of industry lies. It is in this "investment of the future" that we of the present can influence them and events of the future. The opportunity is here now. Let us see to it that we do not fail.

No man should be appointed to manage his fellows on any level of supervision who has not received the fullest and most comprehensive training in his particular sphere of activity. Good management is not an inherited characteristic—it comes only from arduous and prolonged practical training, observation and experience continuously and actively applied.

Rôle of the Metallurgist

I would like to take this opportunity also of addressing a few words to our metallurgists and to their share in our industrial rehabilitation. I would say from my experience that there is a greater need than ever for more technologists in development work; the men who can translate academic research into immediate industrial activity and close the too great gap between present theoretical and practical progress. Their work can be of immediate benefit to mankind and at this particular period in our history I would submit that such work is a matter of some urgency. We want men who will readily scrap outworn ideas, who have the type of practical mind, with the courage to condemn outright much that has been practised and believed in the past in our particular industry. We have had a surfeit of technical literature and so-called research based on too little factual data that leads us to endless and futile discussions and wasted money in subsequent operations.

The Time Lag

As a result of my many tours in other lands I have developed a disquieting feeling that we in Britain have a nationally-shared fault of taking far too much time

in the process of thinking over new ideas and developments, and then look on in wonder and with no little resentment when other countries scoop our new inventions and make money from them. We should rightly suspect mental laziness on our part when it happens and do our best to eradicate it.

Studies on atomic structures of metals are fascinating to our metallurgists, but the present is not the time to attempt to put such thoughts into practice. Rather let us concentrate on technological development of the already practically demonstrated ideas such as dielectric heating for core drying, precision casting to dimensions hitherto thought of as utterly impossible, supersonic testing for castings inspection, centrifugal casting in oil sand moulds and the new techniques for yet higher and higher physical properties in all metals. It is quite an easy and certain process today to produce consistently a 35 ton tensile iron "as-cast," with 55 tons per sq. in. after interrupted quench heat treatments and with impact resistances of the order of 80 ft. lb. or more on a single blow impact test bar of 0.798 in. diameter. Similar examples can be given of parallel improvements in the steel, non-ferrous, and malleable foundries.

The Immediate Future

What can the industry personnel do to raise the standard of its product and the status of its workers, now? I would submit that its immediate job is not to provide ever higher physical property metals that the present-day designer cannot understand and cannot even use, but to manufacture a well finished, perfect surface, accurate shape and sound product, to consistent clear cut and well defined commercial standards, day after day, year in and year out. Materials must be closely controlled in every stage of manufacture, being continuously tested and proved, and with the closest collaboration with the user for his service reports.

There is a need to improve and re-design present equipment to give a higher productive output with less expenditure of human energy. Take for one example the moulding machines in use to-day. There has been little or no basic alteration to their design for over twenty years. Foundrymen must study in greater detail the flow lines of all materials through the foundry. In over thirty years in the foundry industry, and having visited a countless number of foundries, I would unhesitatingly state that in 95 per cent. of the foundries I have seen, an intelligent study of material flow lines would result in much more economical working and greater outputs with little or no alteration and addition to equipment or the labour available. But if you do tackle such a job, do not do it only with drawings. Make a large scale plan of the foundry on plywood or some similar base and use movable models.

There must be a proper use of time and motion studies. Foundry operatives are never antagonistic to such work if it is instituted and approached in a proper manner and their active co-operation requested on the basis of the eventual reduction of human effort. Finally, remove for ever the stigma that foundries are filthy places to work in. Attention to safety, hygiene and good housekeeping undeniably pays good dividends in reducing labour troubles.

I consider that the main reason for lack of new entrants to the foundry and the relatively poor level of citizen status of those already in it is due almost entirely to dirty working conditions and amenities provided, and is not caused by low wage rates and fear of hard manual labour. Foundry owners have themselves created the now desperate need for new entrants to the industry by their almost universal unwillingness to divert part of their finance to the betterment of working conditions.

Bad conditions have persisted for so long that many excellent schemes fail because of suspicion and ignorance on the part of the workers. These must be eradicated by every means available—by managements' personal intervention in new entrant training, by demand for discipline from the trade unions, through primary education with some compulsion if necessary from each and every source available until it becomes so engrained in every workman's mind that it becomes second nature to him. I would like to see a law passed, that no heavy industry workman be allowed on any public transport vehicle in his working clothes. One of the freedoms of democracy need not be licence to transmit sand and coal dust to all and sundry.

Managements Must Manage

Remember that all this will come from good, wise and firm management. Management that is not in full control of an industry means that that industry is dead or dying. Control in the hands of workers means just that also, as invariably worker control upsets price structures and economic balance; they do not instigate enough research and development work which is vital for the healthy future existence of the industry to which they belong. These facts are in danger of being forgotten in many works where so-called industry and works advisory committees are instituted to-day.

We no longer have the single clearly defined objective to which all our efforts were directed through the six years of war. To-day our objectives are many and varied and affected far too greatly by ideological policies. We lack a certain and central directive as to the conditions under which our industry will have to operate in the future; but I would suggest to you that we, through our membership of the Institute of British Foundrymen, can give through our reported discussion on each and every topic with which we deal in the future a definite line of direction and trend of thought to guide and influence our national legislature in its dealings with our industry.

We welcome the plans and promises of financial assistance towards our individual industrial research plans, and towards improved facilities for more scientific and technical education but let us also guide ideas towards a reduction of controls and an encouragement to individual enterprise in an industry which is

second to none in its interest and opportunity for the progressive-minded men and women of to-day.

MR. R. B. TEMPLETON (Past-Branch-President and Vice-President of the Institute), in proposing a vote of thanks to Mr. Currie for his address, said that the President had spoken very admirably upon the question of management. He paid tribute to the way in which the President had addressed the meeting, covering a range of subjects peculiar to the foundry industry; but the one subject he had not mentioned was that of the serious decline in the number of craftsmen, which was of vital importance.

MR. ROUSHAM (Junior Vice-President), seconding the vote of thanks, said that the President had made a sound choice in deciding to talk on the subject of management in his address. The three fundamental points of management had been referred to by Mr. Currie—tact, personality and common sense—and Mr. Rousham said that if the President knew of any libraries where those three points could be studied, he for one would be glad to know of them. The President's address could be summed up by the wish "More control by good management and less control by the Government," which was what we were all looking for.

The vote of thanks was received with acclamation.

* * * *

The PRESIDENT, in the absence of Mr. J. B. Blakeborough, M.A.(Eng.Cantab.) M.I.Mech.E., then presented the latter's Paper, entitled **"A Study of the Basic Principles of Core-blowing by Means of the Ultra Slow Motion Camera,"** and his film on core-blowing entitled **"Sandstorm Secrets."**

The main lesson to be learnt from the showing of this film was the necessity for venting the core box at the point of back pressure nearest to the entry of the sand. Other factors, such as the shape of the core and the influence of moisture, were demonstrated visually—matters difficult to describe in any other manner.

DISCUSSION

DR. D. INGALL said it appeared to him that the filling of the last cavities in many cores illustrated in the film had slowed up considerably, and he asked if that had been due to a falling off of the camera speed, or some phenomenon which had not been mentioned in the Author's conclusions.

The PRESIDENT replied that in that particular case the slacking of speed was due to the air being unable to escape through the vents, as they had been filled up previously, and therefore there would be a definite back pressure against the current of sand entering the cavity.

MR. F. HUDSON said that a further conclusion could be added to those of Mr. Blakeborough, in that not only were plenty of vents needed, but they should be placed in certain determined positions. He had noticed very markedly in the film that a vent went out of action immediately it was closed by the sand stream and, therefore, it would seem that in deciding the positions of vents one should endeavour to place them in those parts of the core boxes which filled last. On the circular shape, for example, which was the simplest form illustrated, the vents were on a vertical diameter and Mr. Hudson considered that if the vents had been placed at the neck at an angle away from the sand, the filling would have been faster still. Furthermore, the back pressure of air would be relieved.

MR. B. LEVY said that he had seen a gauze type vent, of quite a large diameter compared with the cavity of the core boxes, employed in core blowing, and he asked if Mr. Currie considered that the gauze type of vent of large diameter would have effects different from those demonstrated in the film.

MR. CURRIE considered that the vent described by Mr. Levy would produce different effects. The screen or sieve type vent originated in America, where it was used for some considerable time, and eventually came to England. Obviously, in the case of Mr. Blakeborough's film, which was an attempt to demonstrate the way the sand grains packed themselves when blown into a core box, it was essential to cut out some of the variables, and, therefore, an ordinary drilled hole was all that was used.

From his own experience, there were two factors which governed the number and area of the vents used in practical core blowing, one being the leakage that might occur through the joints of the box and the other the grain size of the sand itself. Obviously, leakage was a most difficult thing to measure, and, therefore, when starting to cut a vent into a core box it would seem that the most logical method would be to start with a small one and increase it in size until a perfect packing was obtained.

DR. SKERL considered that the subject under review had come forward about ten to fifteen years late. He had met many foundrymen who had spent a long time in trials with orifices, vents, strength of sand and other factors necessary in the matter of obtaining sound cores, using a core blower. The makers of machines had never given the necessary information to the users—they simply supplied one orifice with the machine and wished the user luck with it! Very little advice was given and, therefore, Mr. Blakeborough's paper and the film, which had shown exactly what did happen, provided a proper basis upon which further work shou'd be done. He also suggested that Mr. Blakeborough might have worked upon some formula which could be used to correlate the various factors.

MR. CURRIE agreed that it would be of considerable help to the industry if a formula could be devised on the question of core blowing. If one could adhere to simple basic shapes, such as were used by Mr. Blakeborough for the purposes of his film, no doubt it could be done, but unfortunately, the majority of shapes which one had to blow all had the re-entrant angles, etc., which would cause trouble. Therefore, it was necessary, when dealing with a new shape, to run a series of trial blows and to observe the way in which the sand packed. It was only by such a method that vents could be positioned.

DR. SKERL suggested that for the shapes employed, the positions of the vents should be known without having to experiment.

MR. CURRIE said that, from his own knowledge, the practice of Blakeborough's, who had done all the work

(*Continued on page* 176.)

Nottingham Discussion on

"Surface Drying of Moulds"*

By A. Cracknell and F. Cousans

(*Concluded from page* 159.)

Practical Applications

MR. COUSANS thought Mr. Newstead had misunderstood the first portion of the Paper. The remarks on page 2 of the preprint were their first conclusions from a survey of the initial work on production moulds. After considering the results on production moulds, they came to the conclusion it was necessary to standardise the mould size in order to get the information together to enable them to go ahead with the drawing up of a scheme for hot-air distribution for the foundry. The background of the work was to find out what volume of air per square foot of mould surface was needed to dry a mould in a reasonably short period of time, and to endeavour to apply that knowledge to the drying of production moulds. From the information which had been obtained from the investigation, apparatus was now on order which would, when installed, enable three or four lines of production to be surface dried. Meters were being put in to enable the volume of air to be controlled to suit the different sizes of mould, so that if, for instance, one had a mould of 16 sq. ft. surface area, it meant sixteen times the unit volume which they had ascertained from the experiments.

Throughout the period of their work, they had endeavoured to make one variation at a time. That was the reason why they had kept constant temperature with varied volume of air, and later, constant volume of air and varied direct temperature.

Referring to Mr. Newstead's question regarding the effect of velocity, seeing that they were working with the standard mould and varied the volume of air, Mr. Cousans thought Mr. Newstead could be assured that they had varied the velocity also.

Surface Hardness

MR. J. L. FRANCIS thought the Paper had brought out something that possibly very few realised, that was the fact that if a mould was skin dried and was allowed to stand, even for a considerable period of time, the moisture which crept back again only amounted to one per cent. Another point was that the Paper did not attempt to deal with design of drying apparatus, but really gave an insight into what happened during the drying and after drying had taken place, from which point of view the experiments had obtained a considerable degree of success. With regard to speed of air flow, he understood that the apparatus used was the same throughout, and therefore he thought they could assume, looking at the graphs, that where the volume increased, the speed also had increased. Although it was not a direct conversion, for "increased volume" could be read "increased velocity." On the question of actual hardness developed in a skin-dried mould, he thought the original moisture content in the sand had some bearing on the final hardness developed, because in his experience he had found that, within limits, more moisture gave a higher hardness after drying. One other interesting point was the method of skin drying by means of inflammable mould dressings. In that connection there was no need to worry about speed of flow or volume of air. A coating was just sprayed on the mould which could be ignited, and the heat gave a skin-drying effect. What he had in mind was that this method actually saved fuel in the form of coke or fuel oil, and drying time also.

MR. CRACKNELL, in reply, said Mr. Francis had stated that the higher the moisture content of the sand itself, the higher would be the strength developed. Following up this subject, the application of mould paint increased the moisture content of the surface layers considerably, it might be that the addition of mould paint containing water resulted in an increased hardness due to the increase in moisture alone. With regard to ignited mould dressings, the Authors had only tried the use of petrol and wood alcohol, but unfortunately could not even get these to burn.

MR. FRANCIS pointed out that it was necessary to use the manufactured spirits type of fuel.

Application to Large Moulds for Steel

DR. C. J. DADSWELL said, in his rapid reading of the present Paper, he could not see any reference to the fact that the work had all been done on moulds for steel castings. Many of them would realise that fact because the work had been done at Catton & Company. Ltd., of Leeds, which was a steel foundry. It was an important thing that this should be known, because skin-drying of moulds in the ironfoundry was not in any way new. In the steel foundry it was not very widely practised, and he felt that perhaps in the last 15 years they had seen a very rapid expansion of green sand moulding. It had revolutionised the steel foundry in this country during that time and during the war particularly. The extension of skin drying in the steel foundry would have, he thought, a great future, and should be followed up with energy. The present Paper was very opportune, and should be an encouragement to others to carry on with experimentation with skin-drying. Dr. Dadswell said he himself had had some experience of it, having started before the war. It was a process that followed logically the application of green sand, and was just as fruitful in saving boxes and space; there were no moulds lying around for two or three days in the foundry, because a quantity could be put on the floor at once and dried. He had in mind

*Paper presented at the Nottingham Conference of the Institute of British Foundrymen, and printed in the JOURNAL, August 7, 14, and 21.

moulds somewhat larger than those described in the Paper, because he had seen made in this way successfully moulds for steel castings up to 20 cwt. and more.

The difficulty with a mould, perhaps with size of three or four cubic feet, was in getting into the pockets, and he had been interested to hear the suggestion made which had passed through his mind whilst he was listening, of combined hot-air drying and torch drying to be used for the larger moulds. Another interesting point he had noted was that the work had been done for obvious reasons on moulding sand of an ordinary green sand combination, King's Lynn red, Leighton Buzzard and bentonite. When one applied the process to moulds for somewhat heavier castings, it was necessary, as Mr. Cracknell had stated, to use something in the mixture to give a greater dry strength, such as a binder in the sand and definitely in the mould paint. The use of a binder made the process a little more foolproof, particularly with torch drying, because the surface did not become friable if it was slightly overdried, as it did in the case of the ordinary green sand mixture.

MR. J. H. COOPER said that from 1908 onwards he had done much work at Darlington, where moulds were dried with plates which were heated in an oven and put over the surface of the mould, and with satisfactory results. The difficulty was in transporting the plates and in putting them over the moulds, and that prevented general adoption of the method. He thought that the 5 per cent. bentonite which they were adding to their mixture seemed a rather high amount, particularly when they were using 5.5 to 5 per cent. of moisture, because one found that bentonite sometimes gave a tendency to cracking. He had also found occasionally that a small addition of fuel oil to the sand was beneficial. On other occasions they used tar sand, which of course gave excellent results on the surface for skin-dried moulds.

Mr. Cracknell said with regard to the remarks of the last speaker that he had never heard of drying by hot plates before, but he would think by their use there would be an air lock between the plate and the mould surface, and that drying would not be so complete. The moisture would not be able to get away easily, and he thought if they had passed hot air in between the hot plate and the mould surface, it would have done the job much more efficiently, but of course he realised this was a method used as far back as 1908. Referring to the use of 5 per cent. bentonite in their sand, they had not experienced cracking under normal conditions of drying but with air at a high temperature there was a tendency for the surface to spall.

Suitability of Air Dried Moulds

Mr. C. Gresty said he had had very little experience of skin-drying, but in reading the Paper there was one point that particularly interested him, and he would like the Authors to expand a little on it. That was conclusion No. 6 on page 5 of the Preprint where they pointed out that an air-dried mould, with the same moisture content as a skin-dried one, was not suitable for use, whereas a skin-dried mould was. Since they had said in conclusion No. 1 that skin-drying could be effectively done at less than 100 deg. C., he would like to hear the Authors say something more as to *why* an air-dried mould was not suitable. This seemed to him a very important fact, because with the same moisture content it appeared that they could cast satisfactorily in one case but not in the other.

MR. CRACKNELL replied that the very fact that the mould was heated and some degree of temperature maintained had a baking effect on the oil in the mould paint. In the ordinary air-dried mould that was not possible since there was no heating medium, and the baking effect was not obtained. Even so, he thought perhaps they had been a bit too strong in their condemnation of airdried moulds, because they had left moulds which had not been skin dried, over the holidays and satisfactorily cast them afterwards, and these were for castings up to a ton in weight.

Vacuum Drying

MR. J. E. LITTLE said recently a very startling remark was made to him that in America somebody had started a vacuum method of drying moulds, and with that method they could dry a mould in about three hours that with normal drying would take about three days. Under these conditions, surely an 18-inch square box ought to dry in about three minutes, and they would then have a completely dry mould, which would be better than the skin-dried one. He wondered whether anyone had heard anything about this process, but he would be very interested if they had.

MR. CRACKNELL replied that he had no experience of that at all. It certainly sounded interesting, and had possibilities, but he thought the effect of heat on the surface would be lost.

MR. LITTLE added that he understood heat was got into the mould somehow.

MR. CRACKNELL said in that case it sounded satisfactory, but he could not say without examining the method more closely and doing experiments on it, besides making castings to see if they came out satisfactorily from such a mould.

In reply to a question from Mr. Wilson, MR. CRACKNELL said that the Authors did not think that moisture from the atmosphere was responsible for "striking back." The second table on page 5 of the preprint showed the moisture content of dried samples which were left to stand in the shop. At 72 hrs. no moisture was found in them and after 120 hrs. only 0.5 per cent. was detected. This amount of moisture was negligible compared with the surface concentration of 1 per cent. which was found in a skin-dried mould which had been left to stand for 20 hrs. However, the fact that moisture *continues* to evaporate into the atmosphere from a skin-dried mould is incompatible with moisture settling back on the mould from the atmosphere at the same time.

Moisture Pick-up

MR. D. FLEMING said he would like to ask the Authors first whether, in discussing the length of time that a mould could be left, they were discussing a mould which had previously been skin-dried in each case. If that

Surface Drying of Moulds

were so, it struck him that the clay itself would be older and not have the affinity for water that it would normally have, and it was not to be expected that the moisture could rise much. He thought that was somewhat supported, in a very rough manner, by core sands, though they were admittedly different. In his shop they used a simple check on the drying efficiency in their core shop. They took a number of routine cores and put them in an artificially saturated atmosphere. If the drying had been efficient, they found the pick-up, which they measured as a "wet regain," to be very low, but if they had not been thoroughly dried and the core compound had not been baked, then they got a "regain" which in a bad case was sufficient to cause complete collapse of the sand.

He had wondered whether the Authors had given thought to a possible extension of their subject, as to how much depth of drying must be obtained to get satisfactory results from the point of view that with moisture still in the body of the mould, there was greater volume of mould gases released on casting than there was on a drier mould, and this larger volume had to be dealt with. He felt the knowledge available as to the volume of gas existing in a mould being cast was not as complete as it might be. It was probably very high near the casting surface, but decreased rapidly away from this surface.

MR. CRACKNELL said he was afraid he had not had any experience with core sands, but with skin-dried moulds there were temperature gradients existing and moisture gradients as well. In that respect there would be every degree from absolutely dry to about 5½ per cent. moisture. As regards the volume of gas generated, he could not give any figures. The Authors had given the figures of moulds cast satisfactorily, and in consequence assumed the process was right. The true approach to any of these problems was to find if the process gave an economical yield of good castings.

Concluding the discussion, the CHAIRMAN (Mr. D. Sharpe) conveyed to the Authors the members' appreciation of the Paper they had presented, and said it appeared to be indicated from various remarks made that there was a request for more information on the same subject, and he personally suggested that the Authors should carry on their investigations, classify them as they had done up to now, and, at a later date, give the Institute the benefit of listening to further comments on tests made. It was very important that research should be concentrated on process details, and he looked upon this subject as being very deserving of attention.

We regret the error in the JOURNAL last week when, in thanking Australian foundrymen for Gift Parcels, the members of the London branch of the Institute of British Foundrymen was stated to be in excess of 160. This branch now has more than 600 members.

"Management" and "Core-blowing"

(*Concluded from page* 173.)

on core blowing just described, had definitely been better as a result of the study.

MR. V. C. FAULKNER (Past-President of the Institute) asked Mr. Currie, as his organisation was consultant for a number of foundries, whether the core practice of Blakeborough's was in advance of that of other foundries.

MR. CURRIE replied that, when compared with other foundries, Blakeborough's practice was pretty good.

MR. F. HUDSON asked if Blakeborough's experiments had been put to commercial purposes.

MR. CURRIE replied that, as far as he knew, there had been no attempt to commercialise what had been done.

MR. E. J. WILLIAMS asked whether there was any method whereby wires could be eliminated, and he suggested the use of resin.

MR. CURRIE said that the suggestion would be submitted to Mr. Blakeborough.

MR. P. D. PINCOTT, proposing a vote of thanks to Mr. Blakeborough, said that he viewed the instructional value of the Paper from two angles. It was true to say that an individual who had been using a core blower had learned its relative efficiency by the hard method and, in fact, all that had been shown in the film about the venting of a core box represented some of the hard work which foundries went through during the 1932-35 period. In those days the core blowers were beginning to show themselves in this country; some came from America and some from Germany and, in fact, at the present time, most of the core blowers were still basically American or German.

The other important point was the sand. The only sand which was really successful in core blowing was the relatively common green sand bonded. It had to have a very high flow and must be of a good mixture. In the early blowers, a type of blowing head was usually surrounded by a gauze disc with a plate at the back.

In one particular type of blower there was an agitator which stirred up the sand in the container, the reason being fairly obvious, because, when one offered a box to a core blower and did not use the agitator, the air blew a solid cylinder of sand of roughly the diameter of the blowing hole through the sand in the hopper, and the remaining sand did not move. The necessity of the agitator was thus proved, together with the fact that, if there were not sufficient sand in the container, a hole would be blown through the centre of the sand and only a trickle would follow it up.

MR. F. J. CHAMBERS, seconding, said the points raised during the discussion had proved beyond any doubt that the matter could be applied in practice. Undoubtedly, it did at least establish the basis for a logical consideration of the problems of core blowing, if not perhaps from a mathematical point of view.

The vote of thanks was received with acclamation.

The PRESIDENT, in concluding the meeting, said that he had seen the film four times and on each occasion had learned something more from it. He proposed a further vote of thanks to the amateur projectionist, Mr. Barrington Hooper. It was carried with enthusiasm.

Mass Production of Cast Steel Bomb Bodies*

By Percy H. Wilson, O.B.E., M.I.Mech.E.

(*Continued from page* 155.)

Steel Casting Ladles

The ladle shells were of nominal 4½-ton size. They were lined with 41 per cent. Al_2O_3 firebrick circles on edge, with the bottom three courses 2½ in. thick and the remainder 2 in. thick. The bottom was covered with a layer of sand and a course of squares laid on edge, giving a thickness of 4½ in. A specially moulded internal teapot spout, consisting of Scotch 42 to 44 per cent. Al_2O_3 squares and soaps was built into the ladle. All joints were of 42 per cent. Al_2O_3 fireclay. The internal spout reduced the capacity of the ladles to 3½ to 4 tons. The life of the ladle linings was 30 heats, with a new spout every 20 heats. The ladles were kept hot by placing over gas burners.

General

Routine laboratory control included analyses of all raw materials, cupola metal, slags and the complete analyses of each heat of steel. Test bars were prepared and broken in a specially equipped test house adjoining the laboratory. Having regard to the output of steel required for the operation of this foundry, the number of ladles and other vessels was relatively small. There were five cupola receivers, eight 8-ton teeming ladles, four rotary furnace shells, 12 converter bodies, and 24 steel ladles. The metal requirements for 6 heats per hour were obtained from the use of one cupola, one rotary furnace and 2 converters, a typical time schedule being as follows:—

Tapping cupola	4 min.
Pouring into second ladle	2 min.
Raking off slag	2 min.
Pouring into rotary furnace	2 min.
Tapping rotary furnace	1 min.
Pouring into converter	1 min.
Setting Tuyeres	1 min.
Blowing time	12 min.
Slagging	2½ min.
Deoxidising	½ min.
Alloying	1 min.
Emptying converter	1 min.

The metal losses in the process were approximately as follows: Cupola, 5 per cent.; rotary furnace, nil; converter, 9 per cent.

Quite apart from any considerations arising from the saving of shipping space, at a time when the supply position of imported ferro-silicon and hematite iron was at its worst, the successful operation of this process did in fact achieve a substantial saving in the cost of the remelted metal.

Design and Operation of the Foundry

Immediately following the first approach to the writer, first by the Ministry of Aircraft Production and later by the Ministry of Supply, experiments were commenced with a view to determining the moulding methods to be adopted, and at the same time to obtain data on other major factors affecting the design and layout of the plant. Drawings of the finished castings are shown in Fig. 7.

At the outset, it was realised that the adoption of any form of mould drying, would entail the provision of drying equipment on a very large scale, if the required rate of output (100 castings per hour) was to be achieved, and accordingly, efforts were directed towards perfecting a moulding technique whereby green sand moulds could be used. After various trials, an adequate source of supply of suitable sand was located, and the practicability of using green sand moulds was established.

It was decided to cast the bombs vertically in pairs with the nose end in the drag half of the mould. The castings were poured through a single downgate, lined with fireclay sleeves, and the metal entered the moulds through two ingates, arranged tangentially to the circumference of the bomb body so as to avoid direct impingement on to the core. The ramming of the moulds was carried out by sandslingers working in conjunction with simple down-draw stripping plate machines.

To produce the requisite output of cores to form the inside profile of the bombs, it was obvious that every possible operation would have to be mechanised,

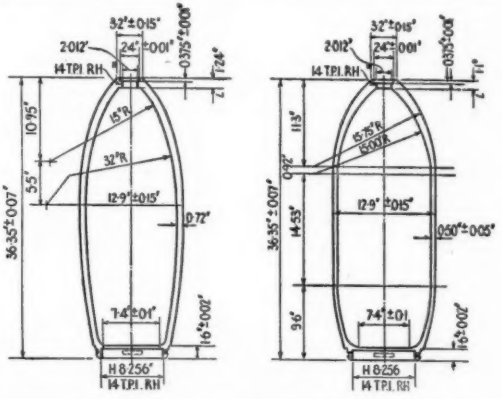


FIG. 7.—DIMENSIONS OF 500-LB. G.P. & M.C. BOMB BODIES.

* Paper presented by the President of the Institute of British Foundrymen at the Nottingham Conference. (Title Abridged).

Mass Production Bombs

especially in view of the fact that only female labour was available for coremaking. The cores were carried on steel core bars wrapped with wood wool rope on to which the core sand was rammed. For the actual ramming of the core a specially designed ramming machine was evolved which consisted of a turntable provided with three stations at which the ramming of the core was progressively carried out. There were eight machines each operated by four women, and the rate of output was slightly in excess of 20 cores per hour per machine.

The heart of the foundry was the endless mould conveyor 230 feet long and 40 feet centres, consisting of a complete articulated train of 58 bogies. The normal loading of the train was approximately 380 tons. Moulding sand, cores and molten steel all converged to this point and from it the castings were taken for further operations.

The general layout of the foundry is shown in Fig. 8, and comprises a sand handling and preparation plant, coremaking section, moulding section, and fettling and despatch section, all of which are separately described in detail in the following paragraphs.

The main building consisted of four bays 537 to 582 feet long, and 45 to 50 feet span with a further bay 275 feet long. The total area of the main and subsidiary buildings was approximately 120,000 sq. ft.

Sand Handling and Preparation

The design of the plant was based on the use of one grade of sand throughout. The core sand was rejected after use, but the used moulding sand was kept in the system and reconditioned with various additions for moulds and cores. The revivification consisted of the addition of new sand equal in amount to the rejected core sand, the normal proportions being 70 per cent. used and 30 per cent. new sand.

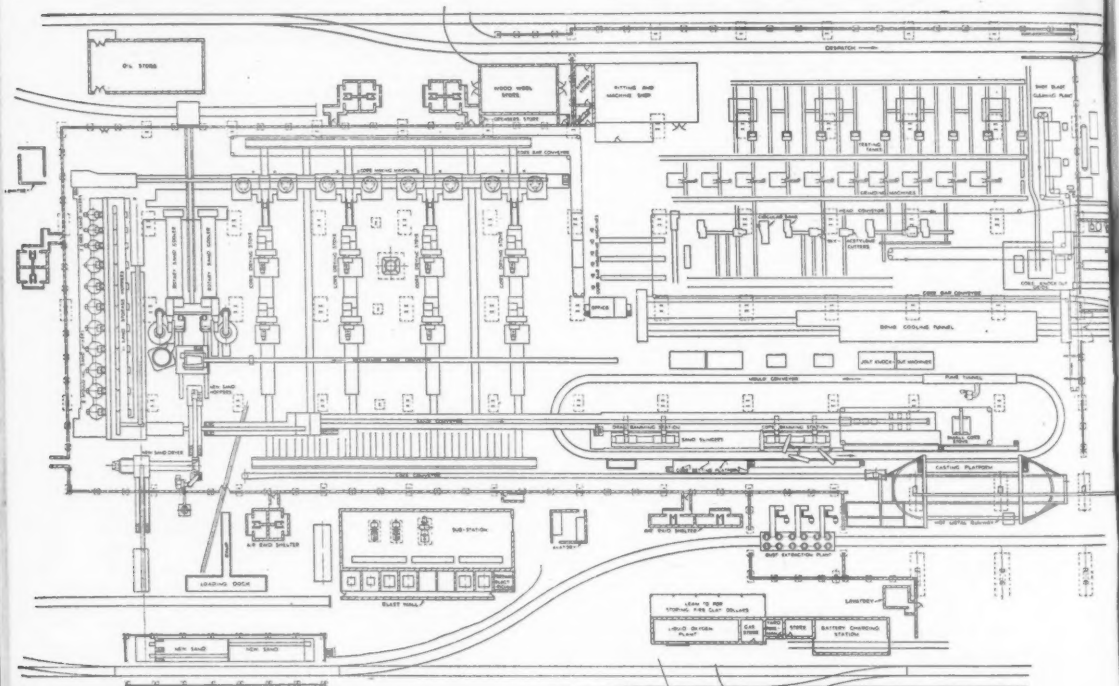


FIG. 8.—GENERAL ARRANGEMENT OF STEEL FOUNDRY.

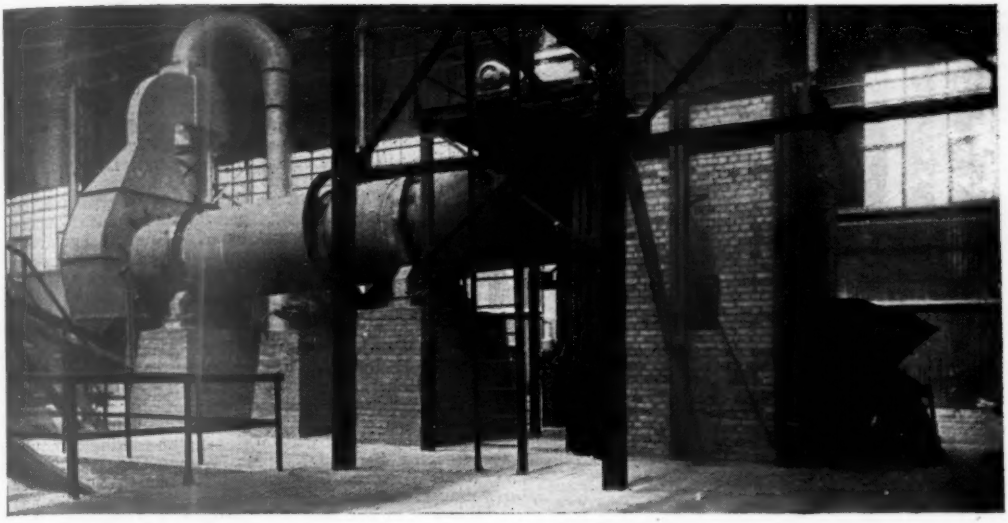


FIG. 9.—NEW SAND DRYER.

Chelford silica sand from two sources was used. The bulk having a grading as below:—

Grading of Chelford Silica Sand.

	Per cent.
Left on 30 B.S.I. sieve	3.0
„ 44 „ „	17.7
„ 60 „ „	37.1
„ 72 „ „	14.7
„ 100 „ „	19.3
„ 150 „ „	6.0
Through 150 „ „	2.2

There were two storage hoppers for new sand in a separate building, each with an approximate capacity of 90 tons. A system of conveyor belts carried the sand to a rotary drum drier in the main building where it was dried to a maximum water content of 0.5 per cent., and delivered to a 10-ton storage hopper.

Used moulding sand was conveyed from the mould knock-outs by an inclined belt which travelled under an overband magnetic separator. This sand was delivered into a 40-ton hopper through a ¾-in. rotary trommel screen which contained a device for breaking down the larger lumps and rejecting superfluous material.

The two storage hoppers were erected in line with each other, and were bounded on each side by a conveyor belt. The bottom of each hopper consisted of two belts delivering the sand on each side to this conveyor. The sand was fed at a rate controlled by the height of suitably placed gates in the side of the hoppers and the mixed sand deposited on the conveyor belt was delivered into two rotary coolers.

These consisted of large drums with internal cruciform construction each capable of handling 30 tons of sand per hour. They were 43 ft. long and 7 ft. 10 in. diameter, driven by gear and pinion from a 30-h.p. motor through a three-speed reduction gearbox.

Each of the coolers was provided with a large centrifugal fan, by which air was drawn through the sand, extracting the fines and cooling the sand. The heavier particles settled into a sump and were delivered outside the building by a short cross belt conveyor. The remainder passed through cyclones to be finally delivered by screw conveyor on to an inclined belt which discharged into a storage hopper located over railway wagons outside the shop. The mixed, desilted sand was delivered by conveyor to eleven storage hoppers, one situated over each sandmixer.

The speed of the fan in the desilting operation could be varied to give different measures of extraction, but as casting conditions and the new sand were fairly constant, it was possible to run successfully with one setting. Once this was established, the removal of fines, silt and dead clay resulted in the grading of the reconditioned sand throughout the operation of the foundry being similar to that at the commencement on 100 per cent. new sand. The characteristics of the material removed were approximately 90 per cent. fine sand and silt grades with 10 per cent. clay grade.

Situated between the storage hoppers and the sand mixers, were eleven corresponding batch hoppers into which the correct amount of sand for each mix was automatically fed by adjustable gates and conveyor belts which formed the bottom of the storage hoppers.

FIG. 10.—SECTION OF SAND HANDLING PLANT, SHOWING NEW SAND HOPPERS IN FOREGROUND AND RECLAIMED SAND SCREEN AND HOPPERS IN BACKGROUND.

Moulding sand was mixed in eight No. 3 August-Simpson mixers in batches of 1,300 lb. with bentonite to give a content of 4 per cent. It was established that 10 per cent. of the bonding material was lost during casting and desilting. Bentonite was added to make up this loss and the full 4 per cent. was added for the proportion of new sand in the mixture. Various moisture contents were tried but it was established that 2.0 per cent. at the Sandslingers was the best from the point of view of both slinging and the finished castings. A slightly higher moisture was added at the mills to compensate for losses *en route* to the Sandslinger hoppers. A total mixing time of 6 min. was allowed, and resulted in the following moulding properties.

Permeability :			Compression :		
Green	..	180	Green	..	4 lb. sq. in.
Baked	..	220	Baked	..	45 „ „

The amount of sand required for a complete mould was 12½ cwt.

(To be continued.)

Notes from the Branches

South Africa

At a meeting held in Johannesburg on July 24, Mr. J. H. West presiding, Mr. G. F. Alexander gave a lecture entitled "Recent Impressions of Some English Foundries." The author gave details of his visits to foundries in the London, Birmingham, Derby, Bradford, and Sheffield areas.

A meeting of the Cape Town Section was held on June 25, when a lecture on "Non-ferrous Foundry Practice" taken from a book of "Foundry Lectures" was read by Mr. H. M. Harris. A general discussion followed.

Wales and Monmouthshire

On October 4 the first meeting of the session was held at the Engineers' Institute, Cardiff, when Mr. Gordon L. Jones, a local member, gave a talk upon "Gating and Risering of Iron Castings." The lecture was fully illustrated with a series of slides and photographs, also a film in technicolour showing the actual behaviour of molten metal flowing and filling a mould.

Opening the meeting, Mr. W. H. Thomas, Branch President, expressed pleasure in the fact that one of the younger members of the Branch had the courage and initiative to put forward his views on this important subject. He congratulated Mr. Jones upon his effort, which he was sure would be accorded an attentive hearing.

Mr. Jones' lecture lasted nearly an hour, and was followed by a discussion that reflected the interest of his audience.

Moving a vote of thanks, Mr. Harold Davies complimented Mr. Jones on his very able presentation of an interesting lecture, profusely illustrated. He had been associated with Mr. Jones frequently of late, and knew how keen he was on this question of runners and risers. He had certainly given the members present abundant food for thought. Mr. McKinlay seconded the vote of thanks, which was carried with acclamation. Mr. Jones briefly replied, thanking members for their attentive reception of his talk.

West Riding of Yorkshire

In his speech at the meeting of the West Riding branch of the Institute of British Foundrymen, held in Bradford on October 11, the president, Mr. D. W. Hammond, referred to the vital role of the foundry industry in obtaining external credit. It was a challenge to the industry which must be met with renewed and concentrated efforts by everyone. Despite the acute shortage of raw materials, fuel, power and labour, the future must be faced with fortitude and no effort spared.

The "Neild" safety first moulders' boots are now out of production, and Mr. G. Neild is advising his customers to send their enquiries to either Wilkins & Denton (London), Limited, Granville Square, King's Cross Road, London, W.C.1, or Briggs Industrial Footwear, Limited, 17-23, Dover Street, Leicester.

United Steel Companies' Output

Progress in Modernisation Plans

The further restriction in the supplies of coal, which for some time have been less than the amount required to support full production, has been the outstanding feature of the company's year, states the annual report of the United Steel Companies, Limited. The winter fuel crisis caused a loss in half a year at the company's works of 92,000 tons of pig-iron and 130,000 tons of steel. The consequent restriction in operations adversely affected the company's financial results.

Pig-iron output in 1946-47 totalled 955,167 tons, compared with 959,282 tons in the previous year. Steel output was 1,708,069 tons, against 1,608,994 tons.

To facilitate the development of chemical products obtainable from coal carbonisation, the structure of the wholly-owned subsidiary, United Coke & Chemicals Company, Limited, has been rearranged, states the report. Its interests in a number of sub-subsidiary colliery companies have been transferred to the parent company, and since June 30, 1947, all coke-oven and chemical plants other than those situated at iron and steel works have been conveyed to that subsidiary company.

The company's main-line railway wagons will vest in the British Transport Commission as from January 1, 1948, by virtue of the Transport Act, 1947. The iron-foundry at Wellingborough known as Thomas Butlin & Company has been sold. A further holding of £467,637 ordinary stock in John Summers & Sons, Limited, has been acquired as part of a new issue, making the company's total holding £2,805,822 ordinary stock.

The schemes for modernisation and extension of the works of the company and its subsidiaries have been hindered by the prevailing stringency of labour and materials. Nevertheless, substantial progress has been made, capital expenditure on work carried out in the year being £3,136,000.

Invisible Exports

The British Export Trade Research Organisation has devised a scheme for invisible exports, which, under the guidance of Lt.-Col. H. A. P. Disney, director of administration for B.E.T.R.O., enables manufacturers to export patent rights and trade secrets to hard-currency countries in return for royalties in dollars.

The scheme has met with both support and criticism. In London it has been suggested that B.E.T.R.O. is advising British manufacturers to sell their trade secrets for a "mess of pottage," while in New York it has been stated that B.E.T.R.O. is attempting to contravene the anti-trust and anti-cartel laws. On the other hand, many British manufacturers are interested in the scheme, and inquiries are also being received from large and small American manufacturers.

At a recent Press conference, Lt.-Col. Disney denied that B.E.T.R.O. sought to impose any conditions on American users of British patents which would contravene their own laws.

Need for More Scrap

Demands of the Steel Industry

Mr. R. M. Shone, Economic Director of the British Iron and Steel Federation, has stressed the need for increased supplies of home scrap in the immediate future in order that the steel industry could fulfil the Government's target of 14,000,000 tons next year. Mr. Shone, who was speaking at a luncheon of the National Federation of Scrap Iron, Steel and Metal Merchants, referred to the encouraging news about the coal allocations for the winter, which, from the information available, seemed likely to provide something like 7 million tons a year if they were fully implemented. It still left a scrap requirement of something like 7¼ million tons of home scrap from all sources, even supposing they got a reasonable importation from Germany and overseas.

That 7¼ million tons compared with 6¼ million tons, which was the rate so far achieved this year, although the rate this year was considerably above the best pre-war year, being about half a million tons greater than in 1937. The task of increasing it by a further million tons next year was desperately difficult.

A joint letter signed by the presidents of the British Iron and Steel Federation, the Joint Iron Council, and the National Federation of Scrap Iron, Steel and Metal Merchants, which has been sent to all industrial concerns throughout the country which are large users of iron and steel, appeals for supplies of steel scrap. It is pointed out that stocks of scrap are precariously low and that the target of 14,000,000 tons of steel in 1948 can be reached only if sufficient supplies of scrap are made available to the steel industry. The industrial firms concerned are asked to help the industry to provide them with iron and steel by sending, through their scrap merchant, every ton of iron and steel for which they have no immediate use. It is emphasised that an increase in scrap supplies must come at once if the production target is to be attained.

Appointment to Research Council

The Lord President of the Council has appointed Prof. P. I. Dee, F.R.S., and Sir William Griffiths to be members of the Advisory Council for Scientific and Industrial Research from October 1. Prof. Dee, who is 43 years of age, is Professor of Natural Philosophy at Glasgow University. He was formerly Superintendent of the Telecommunications Research Establishment. Sir William Griffiths is chairman and managing director of the Mond Nickel Company, Limited. He is a past-president of the Institute of Metals. Sir William is 52.

Prof. Sir Lawrence Bragg, F.R.S., Prof. Sir John Lennard-Jones, F.R.S., Sir Andrew McCance, F.R.S., and Sir Raymond Streat have retired from the Advisory Council on completion of their terms of office.

THE ADDRESS OF THE South of England Ironfounders' Association is now 8, Fredericks Place, Old Jewry, London, E.C.2.

Company News

(Figures for previous year in brackets.)

Hopkinsons—Interim dividend of 7½% (5%).

Metal Agencies—Interim dividend of 10% (same).

Banks & Davis—Interim dividend of 75% (50%).

Associated Fire Alarms—Dividend of 4% (same).

Manley & Regulus—Interim dividend of 5% (same).

Stream-Line Filters—Interim dividend of 5% (same).

Light Production Company—Dividend of 10% (20%).

Cornercroft—Final dividend of 9%, making 15% (same).

F. H. Lloyd & Company—Interim dividend of 3% (same).

Mellor, Bromley & Company—Interim dividend of 17½% (5%).

Serck Radiators—Dividend of 25% (same) and bonus of 5% (nil).

International Diatomite Company—Interim dividend of 7½% (nil).

Martin Bros. (Machinery)—Dividend of 12½% (same) and bonus of 5% (nil).

Manganese Bronze & Brass Company—Interim dividend of 10% (7½%).

Colvilles—Interim dividend of 3% (same) and special interim dividend of 5% (nil).

W. E. Hughes & Company—Interim dividend of 10% (5% on smaller capital).

Watford Electric & Manufacturing Company—Interim dividend of 5% (same).

Bullers—Final dividend of 7½% (same) and bonus of 5% (nil), making 15% (10%).

Expanded Metal Company—Interim dividend of 4%. The company was made public in July, 1947.

C. A. Parsons & Company—Interim dividend of 5%. The company was made public in May last.

Linotype & Machinery—Dividend on the 6% preference shares for the two years ended April 11, 1924.

Arthur Lee & Sons—Final dividend of 30%, making 45% (40%). No bonus is recommended (2½%, tax free).

John Wallace & Sons—Second interim dividend (to be regarded as a final) of 12½% (10%), making 17½% (12½%).

F. Reddaway & Company—Trading profit for 1946, £5,377; dividend of 5% (same); forward, £47,923 (£25,546).

R. & W. Hawthorn, Leslie & Company—Final dividend of 5% (7%), making 11% (same) and bonus of 10% (8%).

Pengkalen—Loss to September 30, 1946, £4,891 (£167); assets recovered, £4,502; to mining costs prior to evacuation, £1,089; forward, £2,858 (£4,336).

Hughes-Johnson Stampings—Final dividend of 7½% (same) and cash distribution of 4½% out of capital surplus released (bonus of 5%), making 19½% (20%).

Reason Manufacturing Company—Profit for the year ended January 31, £3,329 (£4,129); interim dividend of 20% (same); no further dividend is recommended (same); forward, £9,941 (£7,336).

Linley Engineering Company—Net profit for the year ended March 31, £4,553 (£4,012); to general reserve, nil (£1,250); taxation reserve, £2,400 (£1,952); dividend of 10% (same); forward, £5,403 (£4,230).

Jonathan Hattersley & Son—Net profit for the year ended March 31, £20,317 (loss £5,030); dividend of 5% on the "A" shares (nil) and 2% on the "B" shares (nil); to reserve, £1,000 (nil); forward, £1,168 (nil).

Specialloid—Profit to March 31, after recovery of taxation, £46,431 (£37,548); to bank charges, £10,441; net profit, £35,990 (£37,548); to general reserve, £21,750 (nil); final dividend of 50% (75%), making 75% (100%).

Bell Bros. (Manchester 1927)—Net profit, after depreciation and taxation, for the year ended March 31, £4,170 (£8,498); dividend on the preference shares for the year ended March 31, 1942; forward, £9,809 (£9,764).

H. W. Lindop & Sons—Net profit, before tax, to June 30, £17,553 (£7,113); to tax provision, £9,316 (£1,231); general reserve, £2,000 (£5,000); repairs and renewals reserve, £1,000 (nil); dividend of 50%; forward, £3,755 (£2,368).

Villiers Engineering Company—Net profit for the year ended July 31, after depreciation, etc., £94,499 (£47,035); to income tax, £42,700 (£26,704); dividend of 15% (10%); employees' fund, £3,000 (£2,000); forward, £111,418 (£83,244).

Juneero—Trading profit for the year ended June 30, after depreciation, £10,605 (£9,467); other income, £327 (£26); to directors' fees, £1,400 (£1,153); written off development, nil (£1,178); tax, £5,711 (£5,860); dividend of 20%; forward, £1,960 (£339).

Humber Graving Dock & Engineering Company—Net profit for the year ended June 30, £18,814 (£10,075); to contingencies reserve, £8,914 (£3,625); additional dividend of 4%, making 8% (6%); payment to the L.N.E.R. under agreement, £3,300 (£1,650).

Vokes—Trading profit for the year ended June 30, £67,673 (£38,443); to taxation, £48,924 (£17,689); net profit, after fees, etc., £11,390 (£11,549); dividend of 12½% (same); forward, after writing off the whole preference share issue expenses of £2,102, £23,869 (£21,748).

Wombwell Foundry & Engineering Company—Profit for the year to July 31, £18,362 (£17,788); to taxation, £6,025 (£6,821); directors' fees, £750 (£1,050); net profit, £11,587 (£9,917); to depreciation, £2,500 (£2,000); final dividend of 11½%, making 17½% (16%); forward, £8,257 (£7,928).

Kitchen & Wade—Net profit for the year ended March 31, after depreciation, etc., £39,868 (£41,703); E.P.T. recoverable, £9,900 (£13,200); dividend from subsidiary, £6,000 (same); to tax, £29,400 (£34,100); dividend of 25% (same); general reserve, £5,000 (same); forward, £8,320 (£7,577).

Sheffield Forge & Rolling Mills Company—Net profit for the year ended June 30, after providing for depreciation and directors' fees, £43,287 (£21,930); to tax, £24,636 (£9,317); plant replacement reserve, £12,500 (£10,000); final dividend of 10% (same), making 15% (10%); forward, £9,049 (£9,642).

Ferranti—Trading, etc., profit for the year ended June 30, £171,153 (£116,079); to depreciation, £38,000 (£35,000); directors' fees, £3,555 (£4,072); deferred repairs, £24,305 (nil); net profit, £105,293 (£77,007); to general reserve, £60,000 (£40,000); dividend of 6%, tax free (same); forward, £67,507 (£59,464).

Baldwins (Holdings)—Income from interest and dividends, etc., for the year ended September 30, £538,504 (£429,969); to fees, £4,962 (£6,559); management expenses, £5,915 (£6,262); taxation, £239,077 (£194,201); net profit, £288,550 (£222,947); final dividend of 11%, making 16% (12½%); forward, £83,462 (£70,747).

Ductile Steels—Trading profit for the year ended June 30, after depreciation, etc., £86,114 (£37,672); dividend from subsidiary company, £18,181; to taxation, £58,181 (£19,500); final dividend of 17½%, making 30% (20%) and special bonus of 15% (nil); to taxation reserve, £10,000; deferred repairs, £12,000; forward, £16,064 (£13,163).

Wright, Bindley & Gell—Net profit for the year ended June 28, £14,503 (£12,553 after crediting £10,403 E.P.T. repayment and provisions not required); preferred dividend of 7%, plus an additional 1½d. (¾d.) per share; deferred dividend of 3½d. (2d.) per share; balance forward towards payment of future dividends on deferred shares, £15 (£28); to reserve, £2,000 (same); forward, £6,360 (£4,875).

Parsons Marine Steam Turbine Company—Trading profit for the year ended June 30, £105,904 (£215,396); to experimental and development work, £4,426 (£11,340); directors' fees, £1,400 (same); depreciation, £16,765 (£42,559); taxation, £65,500 (£124,750); net profit, £40,879 (£57,365); to patent rights written off, nil (£15,953); to plant replacement reserve, nil (£25,000); final dividend of 11%, making 15% (same); forward, £29,521 (£14,789).

George Wilson Gas Meters—Trading profit to March 31, after depreciation, etc., £40,020 (£28,926); reserve against Government contracts no longer required, £5,000 (nil); to directors' fees, £362 (£337); net profit, £44,658 (£28,589); to taxation, £22,000 (£16,000); written off goodwill of business acquired during year, £2,000 (nil); investment reserve, £3,212 (£4,124); deferred repairs, £5,000 (nil); general reserve, £6,000 (£4,000); dividend of 15% (10%); forward, £5,892 (£5,084).

Renold & Coventry Chain Company—Trading profit for the year ended June 29, after depreciation, E.P.T. and profits tax, etc., £280,424 (£187,148); E.P.T. recoverable, nil (£65,000); net profit, £153,941 (£144,719); E.P.T. recoverable in respect of deficiencies of subsidiaries in previous years, nil (£85,000); to capital reserve, £23,000 (£29,000); general reserve, £40,000 (£120,000); final ordinary dividend of 12%, making 15% (same); dividend on the 226,262 ordinary shares issued in March last of 4%; forward, £32,990 (£30,920).

United Steel Companies—Profit for the year ended June 30, after depreciation, interest, etc., £2,406,890 (£2,353,490); tax provision no longer required, £1,500,000 (nil); to staff and workmen's pension and life assurance schemes, £160,000 (£200,000); central reserve for obsolescence, £125,000 (same); general reserve, £900,000 (£224,487); reserve for income tax, £1,200,000 (£1,131,000); taxation relief in respect of capital expenditure, applied to reserve for depreciation, £213,377 (£150,000); additional provision for depreciation, £750,000 (nil); preference dividends, £104,945; final ordinary dividend of 5½%, making 8% (same); forward, £606,696 (£601,664).

New Trade Marks

The following applications to register trade marks appear in the "Trade Marks Journal":—

"WAKEFIELD LUBREQUIPMENT"—Metal containers, machines, air compressors, etc. C. C. WAKEFIELD & COMPANY, LIMITED, 33, Grosvenor Street, London, W.1.

"ANCALITE"—Insulated electric wire, electric fuse wire and electric cables. BRITISH INSULATED CALLENDER'S CABLES, LIMITED, 103, Mount Street, London, W.1.

"BRYTAL"—Dinner wagons, and parts of aircraft, ships and vehicles. BRITISH ALUMINIUM COMPANY, LIMITED, Salisbury House, London Wall, London, E.C.2.

"MUCON"—Flow control devices for liquid, solid and gaseous substances. MUCON ENGINEERING COMPANY, LIMITED, 10, Beauchamp Place, Kensington, London, S.W.3.

"CANNON" (DEVICE)—Gas-burning, steam-heated, electric or solid-fuel burning installations and apparatus, etc. CANNON IRON FOUNDRIES, LIMITED, Deepfields, near Bilston, Staffs.

"PLUS GAS"—Fuel economising apparatus for the engines of motor vehicles. PLUS-GAS GENERATOR COMPANY, LIMITED, Plus Gas House, 89, Cromwell Road, London, S.W.7.

"PROLITE"—Extruded, rolled, pressed, swaged, drawn, fabricated or semi-fabricated tungsten and molybdenum and alloys. MUREX, LIMITED, Ferry Lane, Rainham, Essex.

"ELOX" (DRILL DEVICE) — Electrically operated machines for removing hard metal. ELOX CORPORATION, c/o Frank B. Dehn & Company, Kingsway House, 103, Kingsway, London, W.C.2.

DEVICE OF INSULATORS—Constructional ironwork for telegraphic, telephonic and electrical power transmission lines. B. BIRKS & COMPANY, LIMITED, Allbut Street Works, Cradley Heath, Staffs.

Personal

MR. P. N. WRIGHT has been appointed a director of the Butterley Company, Limited.

MR. F. J. HOUWERT has been appointed a director of Consolidated Tin Smelters, Limited.

MR. T. F. PEARSON has left Colvilles, Limited, and is now with the Consett Iron Company, Limited.

MR. VICTOR W. BONE has been appointed deputy-chairman of Davey, Paxman & Company, Limited, engineers and ironfounders, of Colchester.

MR. A. P. PETRIE is to retire from the board of the Zinc Alloy Rust-Proofing Company, Limited, Rochdale. He has been a director of the company since its inception.

SIR HUGH CHANCE, deputy chairman of Chance Bros., Limited, lighthouse engineers, etc., of Smethwick, has been appointed chairman in place of MR. W. L. CHANCE, who will remain on the board.

MR. CHARLES S. GILL, managing director of Davy & United Roll Foundry, Limited, and chairman of the British Steel Founders' Association, has been appointed chairman of the Roll Makers' Association.

MR. V. AMBERG, managing director of the Express Lift Company, Limited, Northampton, has been awarded the King Christian X Liberty Medal by the King of Denmark for "valuable assistance rendered to Denmark during the war."

MR. R. JEWSON, who has relinquished the position of chairman of Boulton & Paul, Limited, structural engineers, etc., of Norwich, has been succeeded by MR. J. H. TRESFON. MR. JOHN WILMOT has rejoined the board and has been appointed deputy chairman. MR. R. TAYLOR has been appointed a managing director.

MR. GEORGE T. HYSLOP received presentations at a recent meeting of the Council of the Association of Bronze and Brass Founders in appreciation of the services he has rendered as president of the Association during the past two years. Mr. F. G. Burrell, the president, in making the presentations on behalf of members, said Mr. Hyslop had served the Association unstintingly.

SIR WILFRID AYRE has accepted the invitation of the Minister of Transport to become a member on a part-time basis of the Railway Executive Committee. Sir Wilfrid is chairman and managing director of the Burntisland Shipbuilding Company, Limited, and Hall, Russell & Company, Limited, shipbuilders, engineers, etc., of Aberdeen, while he is associated with a number of other shipbuilding companies.

MAJOR GERALD F. TORREY, MR. G. WIGHAM RICHARDSON, SIR FRANK ALEXANDER, SIR EDWARD WILSHAW and SIR AMOS AYRE, past Prime Wardens, were presented with their badges at a recent meeting of the Court of the Worshipful Company of Shipwrights. The King's Medal was presented to MR. STANLEY FORBES, of the Caledon Shipbuilding & Engineering Company, Limited, Dundee, being the apprentice who has held the senior position for three years.

MR. WILLIAM TODD, on retiring from his position as works manager of the Parkinson Stove Company, Limited, was recently presented with a silver tea service, suitably inscribed, by Mr. R. J. Rogers, deputy chairman, on behalf of the management and staff of the Stechford division of Parkinson & Cowan, Limited. During the 16 years Mr. Todd has been with the company, he has seen many changes, including the mechanisation of the foundry and the installation of the continuous enamelling plant.

Wills

EASON, C. B., late shipyard manager and a director of J. S. Doig (Grimsby), Limited £9,258

PEACOCK, A. T., a director of Peacock & Waller, Limited, mechanical engineers, of Hinckley, Leics £9,633

MARTIN, J. S., general manager for T. W. Greenwell & Company, Limited, ship, engine and boiler repairers, of Sunderland £8,013

DUFFY, LAWRENCE, of Sheffield, metallurgist, author of a number of scientific Papers, and formerly assistant demonstrator in the Metallurgical Department of Sheffield University £10,250

TROUGHTON, E. R., managing director of Lavino (London), Limited, manufacturers of refractories, mixing machinery, etc., chairman of International Diatomite Company, Limited, Molet Products, Limited, and of Unifurnaces, Limited £15,927

New Research Stations for Scotland

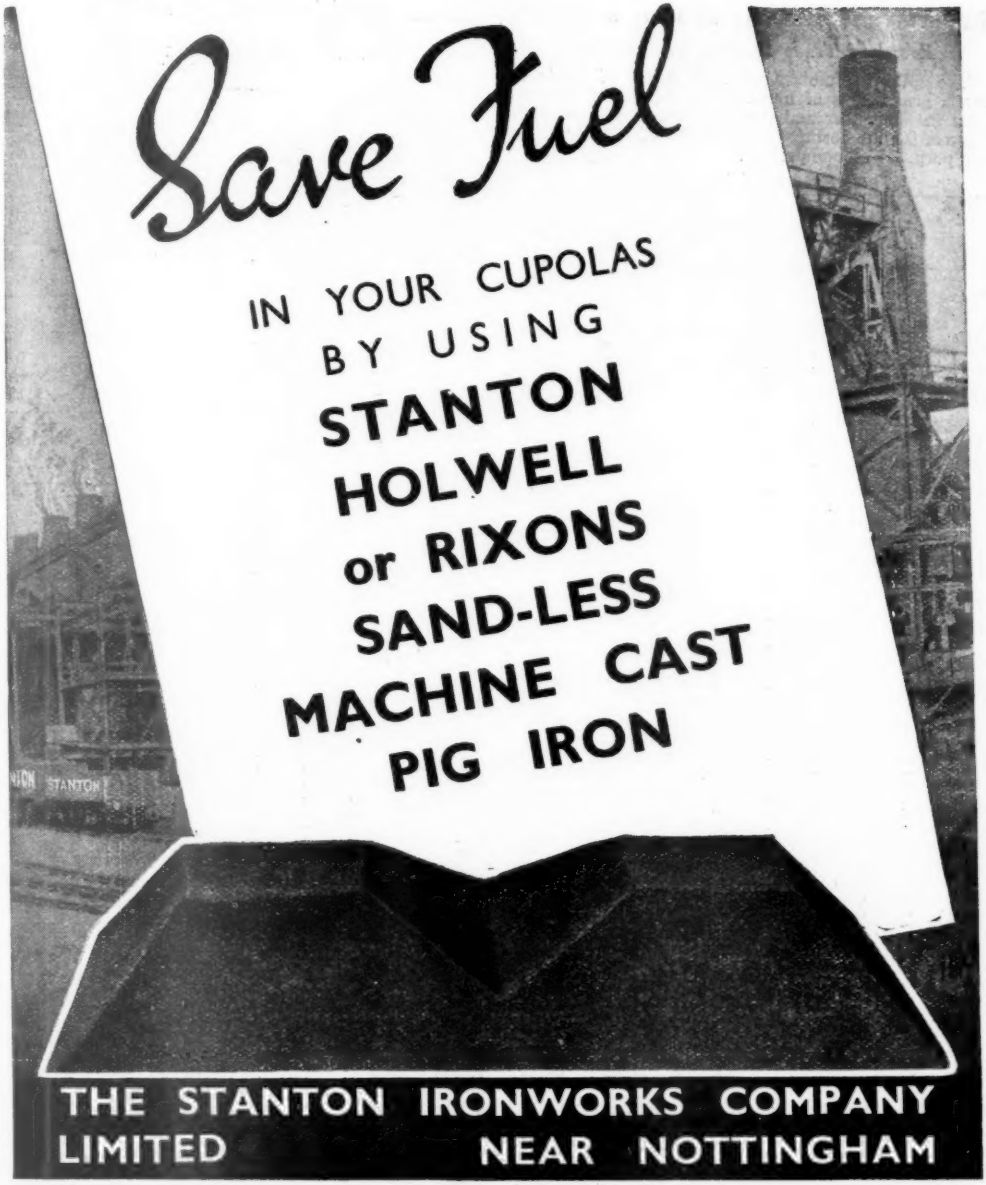
A new mechanical engineering research station is being set up by the Department of Scientific and Industrial Research in Scotland. The station is intended to undertake basic or generic work of the type which forms the groundwork of mechanical engineering development.

It was originally thought that the new station would be best located within 50 miles of London, but the Government has been increasingly concerned about the tendency for every new focus of industrial interest to become concentrated near London, and to counteract this tendency, firms have been discouraged from building factories in certain areas, including London, and encouraged to site them in the development areas, thereby helping to balance the economy of each industrial area. In relation to this policy Government research establishments had also to be considered, and it was clear that to some extent they should conform so as to produce a more even distribution of research activity throughout the country.

A sub-station of the Fuel Research Station is being set up by the D.S.I.R. in Scotland, and will at first be mainly concerned with testing domestic heating appliances. The main Fuel Appliance Testing Station is at Greenwich with the Fuel Research Station.

African Steel Production Plan

Sir Miles Thomas, vice-chairman of the Nuffield organisation, said last week that a plan had been drawn up for steel production in Africa. The scheme, in which John Brown and Firth Brown, of Sheffield, and the Northern and Southern Rhodesian Governments were interested, he said, involved the building of a 300-ft. dam wall across the Zambesi. "Southern Rhodesia," he said, "can become one of the four main sources of world supply of the metal on which everything depends in peace or war—that is, high-grade steel."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THE STANTON IRONWORKS COMPANY
LIMITED NEAR NOTTINGHAM

Imports and Exports of Iron and Steel

Board of Trade Returns for September

The following tables, based on Board of Trade returns, give figures of imports and exports of iron and steel in September and the first nine months of 1947. Figures for the corresponding period of 1938 are given for purposes of comparison.

Total Exports of Iron and Steel

Destination.	September, 1947.	Nine months ended September.	Three-quarters of 1938.
	Tons.	Tons.	Tons.
Eire	4,390	47,133	41,790
Channel Islands	453	5,031	5,562
Malta and Gozo	230	2,356	1,728
Cyprus	350	2,231	1,242
Palestine	2,219	30,452	6,054
British West Africa	3,251	34,555	37,308
Union of South Africa	11,747	121,548	173,316
Northern Rhodesia	372	6,437	15,432
Southern Rhodesia	437	13,029	27,159
British East Africa	3,092	30,143	19,449
British India	13,608	78,913	119,010
Burma	5,211	36,028	13,884
British Malaya	5,423	31,806	49,938
Ceylon	1,542	9,898	19,524
Hong Kong	2,090	16,620	17,697
Australia	2,680	29,175	128,178
New Zealand	3,433	34,976	98,913
Canada	1,413	12,049	64,056
British West India Islands	1,585	24,108	33,189
Anglo-Egyptian Sudan	215	8,592	6,219
Other British countries	3,392	33,880	13,485
Soviet Union	39	2,541	3,261
Finland	4,915	36,405	13,206
Sweden	5,067	69,617	8,982
Norway	4,524	40,091	15,204
Iceland	1,574	6,929	495
Denmark	7,614	76,007	65,442
Poland	32	630	1,866
Netherlands	5,864	73,049	38,670
Belgium	733	15,165	15,243
Luxemburg	—	602	78
France	1,551	16,366	10,041
Switzerland	1,289	12,702	2,085
Portugal	1,313	12,479	5,784
Spain	421	4,125	5,823
Italy	695	5,567	3,855
Greece	1,627	13,840	1,314
Turkey	1,833	10,732	10,317
Dutch East Indies	1,866	17,370	20,481
Dutch West India Islands	1,058	8,128	1,848
Belgian Congo	66	1,352	228
Portuguese East Africa	391	3,953	10,665
Syria	474	2,863	1,953
Egypt	1,908	33,998	25,806
Iraq	3,605	49,489	19,305
Iran	3,425	42,687	82,785
China	8,459	50,312	16,884
U.S.A.	223	8,743	1,641
Colombia	811	6,612	2,868
Venezuela	4,329	25,198	3,507
Ecuador	260	3,859	1,194
Peru	276	3,395	2,274
Chile	821	7,546	4,719
Brazil	1,990	20,885	12,744
Uruguay	1,544	8,997	5,691
Argentine	11,541	68,354	59,517
Other foreign countries	6,271	44,075	68,034
Total	155,542	1,413,623	1,436,906

AT A COST OF OVER £90,000, the four-storeyed Engineering Centre in Sauchiehall Street, Glasgow, is to be opened on November 27. Sir James Lithgow will perform the opening ceremony.

Total Imports of Iron and Steel.

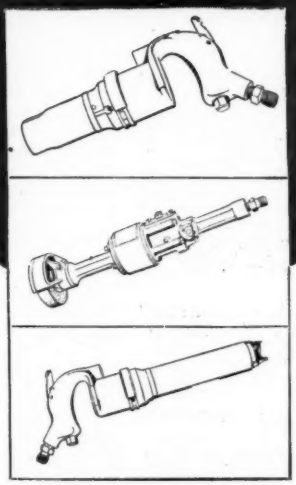
From	September, 1947.	Nine months ended September.	Three-quarters of 1938.
	Tons.	Tons.	Tons.
British India	750	2,429	116,724
Australia	1	43,035	27
Canada	10,461	116,392	88,032
Other British countries	44	1,420	4,200
Sweden	1,217	8,519	67,347
Norway	2,084	19,851	25,332
Belgium	7,840	35,118	205,260
Luxemburg	3,146	8,208	43,950
France	84	1,157	193,011
U.S.A.	15,647	162,844	150,519
Other foreign countries	2,726	12,358	113,820
Total	44,000	411,331	1,008,203
Iron ore and concentrates—			
Manganiferous	4,000	56,299	46,713
Other sorts	600,378	5,079,182	3,826,404
Iron and steel, scrap and waste, fit only for the recovery of metal	36,209	283,319	474,153

Exports of Iron and Steel by Products.

Product.	September, 1947.	Nine months ended September.	Three-quarters of 1938.
	Tons.	Tons.	Tons.
Pig-iron	1,501	41,195	70,455
Ferro-alloys, etc.—			
Ferro-tungsten	149	773	387
Spiegeleisen & ferro-manganese	24	7,980	3,897
All other descriptions*	91	544	786
Ingots, blooms, billets and slabs	50	3,119	7,308
Iron bars and rods	565	4,668	2,397
Sheet and tinplate bars	—	44	9,285
Wire rods	168	2,415	2,385
Bright steel bars	2,249	19,985	4,941
Other steel bars and rods	10,243	106,645	76,509
Special steel	1,281	12,780	3,699
Angles, shapes and sections	6,147	73,435	50,154
Castings and forgings	420	4,221	1,215
Girders, beams, joists and pillars	2,400	22,412	25,104
Hoop and strip	3,153	29,768	28,032
Plates, ¼ in. thick and over	9,740	105,010	98,226
Black plates	2,282	26,529	10,905
Black sheets	2,948	33,922	47,634
Galvanised sheets	8,985	48,935	110,202
Tinplates	14,221	108,385	239,490
Tinned sheets	845	5,790	1,059
Terneplates	20	449	3,243
Decorated tinplates	215	872	3,276
Cast-iron pipes, up to 6-in. dia.	5,409	41,796	36,696
Do., over 6-in. dia.	3,335	28,701	32,223
Wrought-iron tubes	20,054	181,945	164,979
Radiators and central-heating boilers	319	3,011	3,021
Railway material	11,960	116,813	118,617
Wire	2,990	36,999	41,388
Cable and rope	2,045	20,557	12,300
Netting, fencing and mesh	1,387	12,400	7,062
Other wire manufactures	644	5,591	2,754
Nails, tacks, etc.	702	5,907	2,856
Rivets and washers	819	6,019	6,402
Wood screws	273	3,223	1,884
Bolts, nuts and metal screws	1,734	10,744	13,179
Stoves, grates, etc. (excl. gas)	481	4,532	5,256
Sanitary cisterns	97	632	2,109
Fencing material	237	5,283	3,849
Anchors, etc.	908	6,893	4,752
Chains	696	6,567	4,719
Springs	400	4,323	2,949
Hollow-ware	5,399	47,099	8,028
All other manufactures	28,026	198,707	161,331
Total	155,542	1,413,623	1,436,906

* The figures for 1938 are not completely comparable with those for subsequent years.

PLENTY OF CHIPS OFF THE OLD BLOCK



Joe the fettler is making the chips fly because he is using a first-class chipping hammer chosen from the Holman range for this particular job. This range of good tools covers all possible chipping and caulking requirements.

He also makes the sparks fly with another good tool, a size 2 Holman Rotogrind. He finds that it will do any grinding or fettling that comes his way, it carries a fast cutting wheel and it has ample power without undue weight. This is one of a series, ranging from a 4 pounder revving at 16,000, to a surface-type grinder that makes light work of the heaviest casting.

Joe has a pal who is a riveter. Bill does a man's-size job closing 1⅛ in. rivets. But he says that the new tool allocated to him is dandy for the job. It is a Holman "ER" Riveting Hammer, one of the new heavy duty tools. Hidden in a corner of the pneumatic tool store is a Holman "X" Hammer. Bill looks upon that as his own private property and he keeps it "cribbed up" against the time when he is running ⅝ in. rivets again.

Holman PNEUMATIC TOOLS

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News in Brief

THE ADDRESS OF THE Non-ferrous Directorate (Disposals) is now 2, Hyde Park Street, London, W.C.2 (telephone: Ambassador 1290).

THE "ENTERPRISE SCOTLAND" EXHIBITION, which closed on October 18, attracted no fewer than 456,193 visitors, including trade buyers from 21 countries.

MR. G. R. STRAUSS, Minister of Supply, drove the half-millionth Bedford truck off the assembly line at the Vauxhall Motors factory at Luton last week.

THE LATEST technical service bulletin of Borax Consolidated, Limited, 20-24, Moorgate, London, E.C.2, deals with borax in steel wire-drawing operations.

THE ANNUAL first-aid competition of the United Steel Companies, Limited, held at Rotherham recently, was won by the Steel, Peech & Tozer bar-mill team.

SWAN, HUNTER & WIGHAM RICHARDSON, LIMITED, of Wallsend, Northumb, are to lay the keel of a ship which will be the biggest ever built at their Walker Yard.

THE GOODWILL, designs and work-in-progress of Lagonda, Limited, have been bought by Mr. David Brown, head of the David Brown group of engineering companies.

AFTER AN eight days' stoppage, 1,000 timeworkers and 3,000 pieceworkers have resumed work at the Hebburn-on-Tyne works of A. Reyrolle & Company, Limited, manufacturing electrical engineers.

THE GLOBE IRON WORKS in Charles Street, Walsall, formerly occupied by the British & Colonial Horse Shoe & Machine Company, Limited (in voluntary liquidation), has been sold by auction for £21,750.

THE CONSTRUCTION at Dagenham of a new building solely for the production of tractors was announced by Sir Rowland Smith, managing director of the Ford Motor Company, Limited, speaking at Perth last week.

JOSEPH L. THOMPSON & SONS, LIMITED, Sunderland, have received an order from the Anglo-Saxon Petroleum Company, Limited, for two oil tankers of 5,000 tons gross. The machinery will be supplied by Smith's Dock Company, Limited.

LADY EDNAM laid the first stanchion in a scheme for the modernisation of Round Oak Steel Works, Brierley Hill, Staffs, recently. The programme is expected to be completed in two years' time, and it is estimated that the cost will be over £3,000,000.

DURING SEPTEMBER, six ships of 7,173 gross tons were launched on the Tyne, compared with five vessels of 16,910 tons last year. For the first nine months of this year 36 ships of 140,248 gross tons were launched, against 37 vessels of 161,152 tons in 1946.

LITHGOWS, LIMITED, of Port Glasgow, launched from their East yard last week the 9,300-ton cargo motorship Kvernaas, the second vessel they have built for Norwegian owners. John G. Kincaid & Company, Limited, Greenock, are to fit the Diesel engines.

THE INAUGURAL MEETING of the new Peterborough branch of the Incorporated Plant Engineers will be held on November 6 at the Angel Hotel, Peterborough. All plant and works engineers in the area are cordially invited whether members of the Institution or not.

CONTRACTS for the building of three cargo ships for the Argentine Government are reported to have been signed recently. Two are to be built by Cammell Laird & Company, Limited, Birkenhead, and one by Alexander Stephen & Sons, Limited, Glasgow.

COUNCILLOR A. E. ONIONS, speaking at a meeting of the West Bromwich Education Committee, drew attention to the fact that iron and brass founding were well down in the list of school leavers. He said 1,661 juveniles were engaged in the lighter trades, which included 263 in various classes of engineering, but there were only 147 in ironfoundries and 85 in iron and steel works. The chairman (Mr. A. Modley) said foundry work was so essential to the country that he was rather alarmed at this disclosure. No blame, he said, could be attached to the education authority.

Contracts Open

The date given is the latest on which tenders will be accepted. The address is that from which forms of tender may be obtained.

Erith, November 10—(1) 50 cast-iron street-lighting standards, etc.; (2) 12 "Keep Left" bollards, for the Corporation. The Borough Engineer and Surveyor, Council Offices, Erith, Kent. (Fee £1 1s., returnable.)

London, S.W., November 15—Twelve ventilating columns, for the Wandsworth Borough Council. The Borough Engineer, Municipal Buildings, Wandsworth, London, S.W.18.

Warwick—(*a*) Provision and laying of 1,600 yds. of 9-in. and 6-in. dia. spun-iron and stoneware pipe sewers, etc., and 1,430 yds. of 5-in. dia. spun-iron rising main, etc.; (*b*) provision and fixing of two 3-in. non-chokeable sewage pumps, for the Rural District Council. Mr. S. Douglas, 50, Priory Road, Kenilworth.

New Patents

The following list of Patent Specifications accepted has been taken from the "Official Journal (Patents)." Printed copies of the full Specifications are obtainable from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s. each. The numbers given are those under which the Specifications will be printed, and all subsequent proceedings will be taken.

591,838 IMPERIAL CHEMICAL INDUSTRIES, LIMITED. ARMITAGE, N. A., GILL, J. P., and HILL, F. Colouring anodised aluminium.

591,841 STEWARTS AND LLOYDS, LIMITED, DICKIE, H. A., and KERLIE, W. L. Manufacture of steel by the Bessemer process.

591,963 CLUGSTON CAWOOD, LIMITED, and HATCHARD, M. GALLAI-. Apparatus for use in the foaming of blast-furnace slag.

592,028 SOC. ANON. DES HAUTS-FOURNEAUX ET FONDERIES DE PONT-A-MOUSSON. Centrifugal castings.

Reliable refractories, properly applied, are essential to industry. "G.R." is actually a complete refractories industry inside one organisation. The "G.R." range of products includes many brands well known to engineers throughout the world. Whatever type of refractory is needed, the appropriate "G.R." product represents the last word in manufacture, development and research. If you have a difficult problem concerning selection and application, remember that the practical experience of "G.R." engineers, backed by an outstandingly efficient Technical Department, is at the service of all users. To get a better grip of heat, to lengthen the life and improve the cost/output ratio of refractories, it pays to consult "G.R."

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Raw Material Markets

Iron and Steel

Basic pig-iron production is now running at the rate of well over 100,000 tons per week and, although there is a shortage of scrap, the steelmakers are fairly well supplied with material. It has also been found possible to deal more promptly with applications for hematite licences. The output of common foundry pig-iron, however, still falls short of current needs, and it is hoped that ways and means will speedily be devised to overcome this bottleneck which is so seriously retarding the manufacture of light castings.

Deliveries of billets, blooms, slabs, and sheet bars have been on a rather better scale since the beginning of the new period, but the improvement has not been comparable with the expansion in ingot production. Small billets are still particularly scarce, and most of the sheet works are much better off for slabs than for sheet bars. Only small parcels of foreign material are coming to hand, and all sorts of defective material and scrap are being passed into service.

There appear to be no visible limits to the home and foreign demand for finished steel, notwithstanding the recent rise in prices. However, the authorities have now embarked upon a determined effort to reduce the backlog of orders whch is stated to amount to approximately 2 million tons. Steel users are accustomed to waiting periods between the placing of an order and its execution, but inordinately long delays, which latterly have been a common experience, tend to derange industrial programmes, and it will be a boon to consumers generally if allocations can be more closely related to productive capacity. The overhaul of the machinery of distribution will take time, but it has been proved by experience to be a necessary operation. Meanwhile, the plate and sheet mills are overloaded with orders, particularly for the lighter gauges, and there are long waiting lists for joists, sections, channels, etc.

Non-ferrous Metals

Statistics issued by the British Non-ferrous Metals Federation for the United Kingdom output of copper and copper-alloy products from January to September, 1947, show that the output of castings and miscellaneous products (unalloyed copper) was 4,500 tons, which is the same as for the corresponding period in 1946. Production of unalloyed tubes was 25,369 tons, compared with 20,987 tons last year. The output of alloyed copper tubes is given as 10,853 tons, and castings and miscellaneous products 50,307 tons, with a copper content of 7,664 and 40,245 tons respectively. This compares with 11,265 tons for tubes and 46,946 tons for castings and miscellaneous products for the same period in 1946 (copper content 7,949 and 37,557 tons respectively).

Further dissatisfaction with the present price of tin, compared with producers' costs, was expressed by Mr. G. W. Simms, chairman, at the recent general meeting of Geevor Tin Mines, Limited. It was stated that after negotiations with the Ministry of Supply, the company had been unable to secure any amelioration in the contract terms which had been in operation since January, 1945. It was claimed that the terms did not take adequately into consideration the conditions under which the mine was now compelled to operate.

During the first nine months of this year U.K. tin exports were very low, amounting to only 3,318 tons, compared with 18,469 tons for the corresponding period of 1946. Similarly, the arrivals of tin ore in this country, during the same period of this year were also low, totalling 26,572 tons, a decrease of nearly 8,000 tons compared with 1946.

The recent good supplies of scrap lead, which have been selling at low prices, compared with official quotations for the virgin metal, are tightening slightly. Consequently, prices can be expected to come a little more into line with the virgin metal figure, which also suggests that an improvement in supplies of virgin lead will again become urgent.

New Companies

("Limited" is understood. Figures indicate capital. Names are of directors unless otherwise stated. Information compiled by Jordan & Sons, 116, Chancery Lane, London, W.C.2.)

Postland Engineering & Trading Company—£10,000. J. W. E. Banks, Witham-on-the-Hill, Bourne, Lincs.

Non-ferrous Fittings Company, 47, Cattell Road, Small Heath, Birmingham—£2,000. A. and L. Neesham.

C. Hall (Metalworks), 1-5, Coleridge Gardens, London, N.W.6—£15,000. A. J., C. B., and C. R. Hall.

Bletchley Engineering Company, Winsorou, London Road, Slough—£10,000. Rt. Hon. Baron Cadman and H. May.

White Engineering Company (Sheffield)—£25,000. A. G. Lawson, 150, St. Vincent Street, Glasgow, subscriber.

Swansea Sheet Metal Engineers, Albion Works, Morriston, Swansea—£4,000. L. C. and A. Davies, and P. J. Jones.

Arnold Kinnings & Sons, 168, Norwood Road, Southport—Ironfounders, etc. £40,000. A., J. A., and R. H. Kinnings.

W. D. Wilson & Son (Bradford), 9, Booth Street, Bradford—Mechanical engineers, etc. £12,000. W. D. and J. F. Wilson.

T. Smithwaite, 134, High Street, Northallerton—Engineers, etc. £15,000. J. and A. Smirthwaite, A. M. Garden, and M. Bulmer.

Holgate & Williams (Huddersfield), St. Andrews Road, Aspley, Huddersfield—Brassfounders. £1,000. R. Holgate and R. Williams.

Alexander Eaves & Company, 11, Birkenhead Road, Wallasey, Ches—Manufacturers of metal containers. £3,000. A. Eaves and W. H. Whatmough.

Brooks, Cabeldu & Company, Maritime Buildings, Newcastle-upon-Tyne—Metal refiners, etc. £5,000. W., P. A., and E. Brooks, and A. R. Cabeldu.